

What is claimed is:

- 1 1. Apparatus for use in a headend system, the apparatus comprising:
2 means for receiving a plurality of separate MPEG input streams;
3 means for merging the plurality of separate input streams and outputting a merged
4 stream that is capable of being processed by a single PID processor in a television
5 converter apparatus.
- 1 2. The apparatus of claim 1, wherein the plurality of input streams include a first
2 stream having NET PID data and a second stream having headend management system
3 polling data.
- 1 3. The apparatus of claim 1, wherein at least one of the input streams contains DCII
2 data.
- 1 4. The apparatus of claim 3, wherein at least one DCII packet is split in at least two
2 portions across at least two MPEG-2 packets within one of the at least two input streams.
- 1 5. The apparatus of claim 4, wherein the merging means does not insert the packets
2 from another one of the plurality of input streams between any of the at least two portions
3 of the DCII packet.
- 1 6. The apparatus of claim 4, wherein the merging means does not insert a second
2 DCII packet between any of the at least two portions of the DCII packet.
- 1 7. The apparatus of claim 4, wherein the merging means excludes from the merged
2 stream any received packets that precede a first packet having a start bit that is set.
- 1 8. The apparatus of claim 3, wherein:

2 the plurality of input streams include a stream containing headend management
3 system polling data and a NET PID data stream, the NET PID data stream including at
4 least one DCII packet that is split into at least two portions in at least two respective
5 MPEG packets; and

6 the merging means does not insert the headend management system polling data
7 between any of the at least two portions of the DCII packet.

1 9. The apparatus of claim 1, wherein the merging means include a state machine.

1 10. The apparatus of claim 9, wherein the state machine is initialized in a state in
2 which the merging means does not insert packets of a first one of the input streams
3 between contiguous packets of a second one of the input streams.

1 11. The apparatus of claim 1, further comprising second merging means for merging
2 a second plurality of separate input streams and outputting a second merged stream that is
3 capable of being processed by a single PID processor in a television converter apparatus,
4 wherein:

5 a first one of the input streams that is to be received by a first PID processor in the
6 television converter apparatus is received by the first merging means;

7 the first merging means transmits the data from the first input stream to the
8 second merging means within a first output data stream having a datum indicating that
9 the first output data stream is to be received by a second PID processor in the television
10 converter apparatus;

11 the second merging means merges the first output data stream with a second one
12 of the plurality of input streams that is to be received by the first PID processor in the
13 television converter apparatus to form a second output data stream; and

14 the second merging means transmits the second output data stream containing
15 data from the first and second input streams to the first PID processor.

1 12. The apparatus of claim 1, wherein the receiving means include a plurality of user
2 datagram protocol network ports.

1 13. The apparatus of claim 1, wherein the merging means include a respective PID
2 buffer for each one of the input streams.

1 14. The apparatus of claim 13, wherein each PID buffer includes a buffer state
2 machine that tracks a DCII packet completion state for the input stream corresponding to
3 that PID buffer.

1 15. The apparatus of claim 13, wherein:
2 the merging means further comprises an output filter, and
3 only one of the PID buffers at a time transmits data from its corresponding input
4 stream to the output filter.

1 16. The apparatus of claim 15, wherein the one of the PID buffers that is currently
2 transmitting data to the output filter continues to transmit data until transmission of a
3 DCII packet is completed.

1 17. The apparatus of claim 16, wherein:
2 an end of the DCII packet is contained within an MPEG packet; and
3 the one of the PID buffers that is currently transmitting data to the output filter
4 continues to transmit data to the output filter after transmission of the DCII packet is
5 completed, if a second DCII packet begins within the same MPEG packet as the DCII
6 packet.

1 18. The apparatus of claim 16, wherein a next one of the PID buffers begins to
2 transmit data to the output filter when an end of a DCII packet contained within an
3 MPEG packet is transmitted to the output filter, if the MPEG packet does not contain the
4 start of a second DCII packet immediately following the DCII packet.

1 19. The apparatus of claim 15, wherein the output filter rennumbers an MPEG PID
2 value of the merged stream.

1 20. The apparatus of claim 15, wherein the output filter provides the merged stream to
2 one of the group consisting of a network user datagram protocol address/port, a serial
3 port, or a STDOUT.

1 21. A system comprising:
2 a headend system, comprising:
3 means for receiving a plurality of separate MPEG input streams;
4 means for merging the plurality of separate input streams and outputting a
5 merged stream; and
6 a television converter apparatus that receives the merged stream, the television
7 converter apparatus including a plurality of PID processors, wherein one of the PID
8 processors processes the merged stream.

1 22. The system of claim 21, wherein the television converter apparatus is
2 programmed to receive headend management system polling data via a PID processor
3 that is also used to receive NET PID data.

1 23. The system of claim 21, wherein the television converter apparatus is
2 programmed to receive updated middleware program code via a middleware PID
3 processor.

1 24. The system of claim 23, wherein the middleware PID processor does not extract
2 any other stream from the merged stream except the stream containing the updated
3 middleware program code.

1 25. A method for operating a headend system, comprising the steps of:
2 receiving a plurality of separate MPEG input streams;
3 merging the plurality of separate input streams and outputting a merged stream
4 that is capable of being processed by a single PID processor in a television converter
5 apparatus.

- 1 26. The method of claim 25, wherein at least one of the input streams contains DCII
2 data.
- 1 27. The method of claim 26, wherein the merging step includes splitting at least one
2 DCII packet in at least two portions across at least two MPEG-2 packets within one of the
3 at least two input streams.
- 1 28. The method of claim 27, wherein the merging step includes a step of excluding
2 from the merged stream any received packets that precede a first packet having a start bit
3 that is set.
- 1 29. The method of claim 25, wherein the headend has a plurality of buffers, and the
2 merging step includes only transmitting data from one of the buffers at a time its to an
3 output.
- 1 30. The method of claim 29, further comprising continuing to transmit data from the
2 one of the buffers that is currently transmitting data to the output until transmission of a
3 DCII packet is completed.
- 1 31. The apparatus of claim 30, further comprising continuing to transmit data from
2 the same one of the buffers that is currently transmitting data after transmission of the
3 DCII packet is completed, if a second DCII packet begins within the same MPEG packet
4 as the DCII packet.
- 1 32. The apparatus of claim 30, further comprising transmitting data from a next one
2 of the buffers when an end of a DCII packet contained within an MPEG packet is
3 transmitted to the output, if the MPEG packet does not contain the start of a second DCII
4 packet immediately following the DCII packet.
- 1 33. The apparatus of claim 15, wherein the output filter updates MPEG continuity
2 counters of the merged stream.